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(54) DISHWASHER AND HINGE ASSEMBLY THEREOF

GESCHIRRRSPÜLMASCHINE UND SCHARNIERANORDNUNG DAFÜR

LAVE-VAISSELLE ET ENSEMBLE CHARNIÈRE DE CELUI-CI

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Description

FIELD

[0001] The present disclosure relates to a technical field of household appliances, especially to a hinge assembly for a dishwasher and a dishwasher having the same.

BACKGROUND

[0002] An action of opening or closing a door of a dishwasher is usually achieved through a hinge mechanism, which does a rotational movement via a defined rotating shaft. The hinge mechanism in the related art has a complex structure and many components, even more than five, resulting in a low efficiency in assembling and production.

US 2011187246 A1 discloses a dishwasher including a housing (1) having an opening in a front and a hinge shaft (43) for holding dishes to be washed therein, a door (2) rotatably mounted with the hinge shaft (43) for selective opening/closing of the opening in the housing (1), and a falling off preventive unit for preventing the door (2) from falling off the hinge shaft (43) in a case the door (2) rotates.

CN 201416331 Y discloses a door hinge device of dishwasher, which includes a door hinge (1) and a rotating shaft (2); the door hinge (1) is hinged at the rotating shaft (2). A plastic gasket (3) is arranged between the door hinge (1) and the rotating shaft (2). The door hinge device of dishwasher adopts the structure that: the plastic gasket is arranged between the door hinge and the rotating shaft.

SUMMARY

[0003] The present disclosure aims to solve one of the technical problems in the related art to at least some extent.

[0004] Accordingly, one objective of the present disclosure aims to provide a hinge assembly for a dishwasher, which is simple in structure and convenient to assemble, and has a high production efficiency.

[0005] Another objective of the present disclosure is to provide a dishwasher having the hinge assembly mentioned above.

[0006] The hinge assembly according to embodiments of the present disclosure includes: a hinge friction sleeve having an inserting groove, in which the inserting groove extends along a length direction of the hinge friction sleeve and has a first end provided with a snap-fitting rod and a second end provided with a snap-fitting portion; and an L-shaped hinge having a horizontal limb fitted within the inserting groove, in which the horizontal limb has a first end snap-fitted with the snap-fitting rod and a second end provided with an open axial groove fitted with the snap-fitting portion, the snap-fitting portion is snap-fitted within the open axial groove to close an opening of

the open axial groove, and an upper edge of the open axial groove is spaced apart from an upper edge of the snap-fitting portion at a predetermined distance.

[0007] In the hinge assembly according to embodiments of the present disclosure, the first end of the horizontal limb of the L-shaped hinge is snap-fitted with the snap-fitting rod of the hinge friction sleeve, and the second end of the horizontal limb of the L-shaped hinge is snap-fitted with the snap-fitting portion of the hinge friction sleeve, which is simple in structure and convenient to assemble and disassemble, and has a high production efficiency.

[0008] In addition, the hinge assembly according to embodiments of the present disclosure may further have the additional technical features as followed.

[0009] According to an embodiment of the present disclosure, a left side wall of the open axial groove is provided with a first concave portion and a right side wall thereof is provided with a second concave portion, and the snap-fitting portion includes a left snapping leg having a first convex hook fitted with the first concave portion and a right snapping leg having a second convex hook fitted with the second concave portion.

[0010] According to an embodiment of the present disclosure, the first convex hook has a first branch leg thereon and the second convex hook has a second branch leg thereon.

[0011] According to an embodiment of the present disclosure, respective upper edges of the first branch leg and the second branch leg are rounded off.

[0012] According to an embodiment of the present disclosure, the first end of the horizontal limb of the L-shaped hinge has a snap hook fitted with the snap-fitting rod.

[0013] According to an embodiment of the present disclosure, the snap hook is a U-shaped snap hook and a section of the snap-fitting rod is shaped as a semicircle or a circle.

[0014] According to an embodiment of the present disclosure, a front surface of the hinge friction sleeve has a convex rib thereon.

[0015] According to an embodiment of the present disclosure, a plurality of the convex ribs are provided and spaced apart evenly along the length direction of the hinge friction sleeve.

[0016] According to an embodiment of the present disclosure, a rear surface of the hinge friction sleeve has a supporting boss thereon.

[0017] A dishwasher according to embodiments of the present disclosure includes the hinge assembly according to any one of the embodiments above.

[0018] Additional aspects and advantages of the present disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019]

Fig. 1 is a schematic view of a hinge assembly for a dishwasher according to a first embodiment of the present disclosure;

Fig. 2 is a schematic view of a hinge of the hinge assembly for a dishwasher according to the first embodiment of the present disclosure;

Fig. 3 is a schematic view of a hinge friction sleeve of the hinge assembly for a dishwasher according to the first embodiment of the present disclosure;

Fig. 4 is a partially enlarged view of portion "A" in Fig. 3;

Fig. 5 is another schematic view of the hinge friction sleeve of the hinge assembly for the dishwasher according to the first embodiment of the present disclosure; and

Fig. 6 is a schematic view of a dishwasher according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0020] Embodiments of the present disclosure will be described in detail. Examples of the embodiments are shown in the drawings. The same or similar elements and the elements having same or similar functions are denoted by like reference numerals throughout the descriptions. The embodiments described herein with reference to drawings are explanatory, and used to generally understand the present disclosure, and shall not be construed to limit the present disclosure.

[0021] In the following, a hinge assembly 100 for a dishwasher according to embodiments of the present disclosure will be described in detail with reference to the drawings.

[0022] As shown in Figs. 1 to 6, the hinge assembly 100 according to embodiments of the present disclosure includes: a hinge friction sleeve 11 and an L-shaped hinge 12.

[0023] Specifically, the hinge friction sleeve 11 has an inserting groove 111 extending along a length direction of the hinge friction sleeve 11 (i.e. a direction indicated by the left and right arrow shown in Fig. 3). A first end (i.e. a left end of the inserting groove 111 shown in Fig. 3) of the inserting groove 111 is provided with a snap-fitting rod 112, and a second end (i.e. a right end of the inserting groove 111 shown in Fig. 3) of the inserting groove 111 is provided with a snap-fitting portion 113.

[0024] As shown in Fig. 2, the L-shaped hinge 12 has a horizontal limb 121 fitted within the inserting groove 111. The horizontal limb 121 of the L-shaped hinge 12 has a first end (i.e. a left end of the horizontal limb 121 shown in Fig. 2) snap-fitted with the snap-fitting rod 112 and a second end (i.e. a right end of the horizontal limb 121 shown in Fig. 2) provided with an open axial groove 1212 fitted with the snap-fitting portion 113. The snap-

fitting portion 113 is snap-fitted within the open axial groove 1212 to close an opening of the open axial groove 1212. An upper edge of the open axial groove is spaced apart from an upper edge of the snap-fitting portion 113 at a predetermined distance to accommodate a rotating shaft of the dishwasher.

[0025] More specifically, as shown in Fig. 2, according to an embodiment of the present disclosure, a left side wall of the open axial groove 1212 is provided with a first concave portion 1212a and a right side wall of the open axial groove 1212 is provided with a second concave portion 1212b.

[0026] As shown in Fig. 4, the snap-fitting portion 113 includes a left snapping leg 1131 and a right snapping leg 1132. The left snapping leg 1131 has a first convex hook 1131a fitted with the first concave portion 1212a, and the right snapping leg 1132 has a second convex hook 1132a fitted with the second concave portion 1212b. That is, when the snap-fitting portion 113 is inserted into the open axial groove 1212, the first convex hook 1131a is snap-fitted within the first concave portion 1212a and the second convex hook 1132a is snap-fitted within the second concave portion 1212b.

[0027] Advantageously, according to an embodiment of the present disclosure, the first convex hook 1131a has a first branch leg 1131b thereon and the second convex hook 1132a has a second branch leg 1132b thereon. Further, respective upper edges of the first branch leg 1131b and the second branch leg 1132b are rounded off. Thus, when the rotating shaft 201 of the dishwasher is fitted within a space defined by the open axial groove 1212 and the snap-fitting portion 113, the hinge assembly 100 for the dishwasher according to embodiments of the present disclosure may rotate more flexibly.

[0028] As shown in Fig. 2, according to an embodiment of the present disclosure, the first end of the horizontal limb 121 of the L-shaped hinge 12 has a snap hook 1211 fitted with the snap-fitting rod 112. Advantageously, the snap hook 1211 is a U-shaped snap hook and a section of the snap-fitting rod 112 is shaped as a semicircle or a circle. Thus, the snap fitting is firm.

[0029] An assembling process of the hinge assembly 100 used for the dishwasher according to embodiments of the present disclosure will be simply introduced in the following.

[0030] The hinge friction sleeve 11 and the L-shaped hinge 12 are provided. Firstly, the first end of the L-shaped hinge 12 passes through the inserting groove 111 of the hinge friction sleeve 11, and hence the snap hook 1211 is snap-fitted with the snap-fitting rod 112. Then, the hinge friction sleeve 11 is rotated around the snap-fitting rod 112 so as to make the snap-fitting portion 113 snap-fitted with the open axial groove 1212. Thus, the assembling of the hinge assembly 100 according to embodiments of the present disclosure is finished.

[0031] A disassembling process of the hinge assembly 100 used for the dishwasher according to embodiments of the present disclosure is the reverse process of the

assembling process, which will not be described herein.

[0032] In the hinge assembly according to embodiments of the present disclosure, the first end of the horizontal limb of the L-shaped hinge is snap-fitted with the snap-fitting rod of the hinge friction sleeve, and the second end of the horizontal limb of the L-shaped hinge is snap-fitted with the snap-fitting portion of the hinge friction sleeve, which is simple in structure and convenient to assemble and disassemble, and has a high production efficiency.

[0033] As shown in Fig. 3, according to an embodiment of the present disclosure, a front surface of the hinge friction sleeve 11 has a convex rib 114 thereon. Advantageously, a plurality of the convex ribs 114 are provided and spaced apart evenly along the length direction of the hinge friction sleeve 11. Thus, the hinge assembly 100 according to embodiments of the present disclosure is in line contact with other components when rotating, which reduces a friction area.

[0034] As shown in Fig. 5, according to an embodiment of the present disclosure, a rear surface of the hinge friction sleeve 11 has a supporting boss 115 thereon, to serve as a support for the other components of the dishwasher.

[0035] It shall be noted that, the hinge friction sleeve may be integrally molded from modified poly butylene terephthalate (MPBT) or polyoxymethylene (POM), which is molded easily at a low cost.

[0036] As shown in Fig. 6, the dishwasher according to embodiments of the present disclosure includes an inner tank 200 provided with a dishwasher shaft 201, and the hinge assembly 100 used for the dishwasher according to embodiments of the present disclosure is pivotably mounted onto the dishwasher shaft 201. A door body 300 is mounted onto a vertical limb 122 of the L-shaped hinge 12 of the hinge assembly 100 according to embodiments of the present disclosure.

[0037] Specifically, first the open axial groove 1212 of the L-shaped hinge 12 is snapped onto the dishwasher shaft 201, then the first end of the L-shaped hinge 12 passes through the inserting groove 111 of the hinge friction sleeve 11, and hence the snap hook 1211 is snap-fitted with the snap-fitting rod 112. Finally, the hinge friction sleeve 11 is rotated around the snap-fitting rod 112 so as to make the snap-fitting portion 113 snap-fitted with the open axial groove 1212. Consequently, the dishwasher shaft 201 is surrounded by the open axial groove 1212 and the snap-fitting portion 113.

[0038] Based on the structure of the L-shaped hinge 12, the hinge assembly 100 according to embodiments of the present disclosure can rotate around the dishwasher shaft 201 for 90 degrees so as to implement actions of opening and closing the door.

[0039] The hinge assembly 100 used for the dishwasher according to embodiments of the present disclosure is simple in structure, convenient and reliable to assemble and disassemble, which improves the production efficiency greatly and saves the cost.

[0040] Although embodiments have been shown and described, it would be appreciated that the embodiments above are explanatory and cannot be construed to limit the present disclosure, and changes, alternatives, transformation and modifications to the embodiments above can be made by those skilled in the art in the scope of the appended claims.

10 Claims

1. A hinge assembly (100) for a dishwasher, the hinge assembly comprising:

a hinge friction sleeve (11) having an inserting groove (111), wherein the inserting groove (111) extends along a length direction of the hinge friction sleeve (11) and has a first end provided with a snap-fitting rod (112) and a second end provided with a snap-fitting portion (113); and an L-shaped hinge (12) having a horizontal limb (121) fitted within the inserting groove (111), wherein the horizontal limb (121) has a first end snap-fitted with the snap-fitting rod (112) and a second end provided with an open axial groove (1212) fitted with the snap-fitting portion (113), the snap-fitting portion (113) is snap-fitted within the open axial groove (1212) to close an opening of the open axial groove (1212), and an upper edge of the open axial groove (1212) is spaced apart from an upper edge of the snap-fitting portion (113) at a predetermined distance; wherein the hinge friction sleeve (11) and the L-shaped hinge (12) are configured to be fixed to the dishwasher and the hinge assembly (100) is configured to be pivotably mounted onto a dishwasher shaft (201); a door body 300 of the dishwasher is configured to be mountable onto a vertical limb (122) of the L-shaped hinge (12), and the open axial groove (1212) of the L-shaped hinge (12) is snapped onto the dishwasher shaft (201) that is provided with an inner tank (200) of the dishwasher, such that the dishwasher shaft (201) is surrounded by the open axial groove (1212) and the snap-fitting portion (113).

2. The hinge assembly (100) according to claim 1, wherein a left side wall of the open axial groove (1212) is provided with a first concave portion (1212a) and a right side wall thereof is provided with a second concave portion (1212b), and the snap-fitting portion (113) comprises a left snapping leg (1131) having a first convex hook (1131a) fitted with the first concave portion (1212a) and a right snapping leg (1132) having a second convex hook (1132a) fitted with the second concave portion (1212b).

3. The hinge assembly (100) according to claim 2, wherein the first convex hook (1131a) has a first branch leg (1131b) thereon and the second convex hook (1132a) has a second branch leg (1132b) thereon. 5
4. The hinge assembly (100) according to claim 3, wherein respective upper edges of the first branch leg (1131b) and the second branch leg (1132b) are rounded off. 10
5. The hinge assembly (100) according to claim 1, wherein the first end of the horizontal limb (121) of the L-shaped hinge (12) has a snap hook (1211) fitted with the snap-fitting rod (112). 15
6. The hinge assembly (100) according to claim 5, wherein the snap hook (1211) is a U-shaped snap hook, and a section of the snap-fitting rod (112) is shaped as a semicircle or a circle. 20
7. The hinge assembly (100) according to claim 1, wherein a front surface of the hinge friction sleeve (11) has a convex rib (114) thereon.
8. The hinge assembly (100) according to claim 7, wherein a plurality of the convex ribs (114) are provided and spaced apart evenly along the length direction of the hinge friction sleeve (11). 30
9. The hinge assembly (100) according to claim 7, wherein a rear surface of the hinge friction sleeve (11) has a supporting boss (115) thereon.
10. A dishwasher, **characterized in that** the dishwasher comprises a hinge assembly (100) for a dishwasher according to any one of claims 1-9. 35

Patentansprüche

1. Scharnieranordnung (100) für eine Geschirrspülmaschine, wobei die Scharnieranordnung umfasst:

eine Gelenkreibungshülse (11) mit Einstecknut (111), wobei sich die Einstecknut (111) entlang einer Längsrichtung der Gelenkreibungshülse (11) erstreckt und ein erstes Ende mit einer Schnappverschlußstange (112) und ein zweites Ende mit einem Schnappverschlußteil (113) aufweist; und 45

ein L-förmiges Scharnier (12) mit einem horizontalen Schenkel (121), der in die Einstecknut (111) eingepasst ist, wobei der horizontale Schenkel (121) ein erstes Ende aufweist, das in die Schnappverschlußstange (112) einrastet und ein zweites Ende, das mit einer offenen Axialnut (1212) versehen ist und mit dem Schnapp-

verschlußteil (113) verbunden ist, wobei das Schnappverschlußteil (113) in die offene Axialnut (1212) einrastet, um eine Öffnung der offenen Axialnut (1212) zu verschließen, wobei die Oberkante der offenen Axialnut (1212) in einem vorbestimmten Abstand zur Oberkante des Schnappverschlußteils (113) beabstandet ist; wobei die Gelenkreibungshülse (11) und das L-förmige Scharnier (12) dafür ausgelegt sind, an der Geschirrspülmaschine befestigt zu werden und die Scharnieranordnung (100) dafür ausgelegt ist, schwenkbar an der Geschirrspülmaschinenwelle (201) montiert zu werden; einen Türkörper (300) der Geschirrspülmaschine, der dafür ausgelegt ist, an einen vertikalen Schenkel (122) des L-förmigen Scharniers (12) montiert zu werden, wobei die offene Axialnut (1212) des L-förmigen Scharniers (12) auf die mit einem Innentank (200) versehene Geschirrspülmaschinenwelle (201) aufgeschnappt wird, so dass die Geschirrspülmaschinenwelle (201) von der offenen Axialnut (1212) und dem Schnappverschlußteil (113) umgeben ist.

2. Scharnieranordnung (100) gemäß Anspruch 1, wobei eine linke Seitenwand der offenen Axialnut (1212) mit einem ersten konkaven Abschnitt (1212a) und eine rechte Seitenwand der offenen Axialnut (1212) mit einem zweiten konkaven Abschnitt (1212b) versehen ist und wobei der Schnappverschlußteil (113) einen linken Einschnappschenkel (1131) mit einem mit dem ersten konkaven Abschnitt (1212a) verbundenen ersten konvexen Haken (1131a) sowie einen rechten Einschnappschenkel (1132) mit einem mit dem zweiten konkaven Abschnitt (1212b) verbundenen zweiten konvexen Haken (1132a) aufweist. 35
3. Scharnieranordnung (100) gemäß Anspruch 2, wobei der erste konvexe Haken (1131a) einen daran angeschlossenen ersten Zweigschenkel (1131b) aufweist und der zweite konvexe Haken (1132a) einen daran angeschlossenen zweiten Zweigschenkel (1132b) aufweist. 40
4. Scharnieranordnung (100) gemäß Anspruch 3, wobei die jeweiligen Oberkanten des ersten Zweigschenkels (1131b) und des zweiten Zweigschenkels (1132b) abgerundet sind.
5. Scharnieranordnung (100) gemäß Anspruch 1, wobei am ersten Ende des horizontalen Schenkels (121) des L-förmigen Scharniers (12) ein Hakensprengring (1211) an der Schnappverschlußstange (112) angebracht ist.
6. Scharnieranordnung (100) gemäß Anspruch 5, wobei der Hakensprengring (1211) ein U-förmiger Ha-

kensprengring ist und wobei ein Teil der Schnappverschlußstange (112) als Halbkreis oder als Kreis geformt ist.

7. Scharnieranordnung (100) gemäß Anspruch 1, wobei eine Vorderfläche der Gelenkreibungshülse (11) eine konvexe Rippe (114) aufweist. 5
8. Scharnieranordnung (100) gemäß Anspruch 7, wobei eine Vielzahl von konvexen Rippen (114) vorgesehen und entlang der Längsrichtung der Gelenkreibungshülse (11) gleichmäßig beabstandet sind. 10
9. Scharnieranordnung (100) gemäß Anspruch 7, wobei eine Hinterfläche der Gelenkreibungshülse (11) ein Auflager (115) aufweist. 15
10. Geschirrspülmaschine, **dadurch gekennzeichnet, dass** die Geschirrspülmaschine eine Scharnieranordnung (100) für eine Geschirrspülmaschine gemäß einem der Ansprüche 1 bis 9 aufweist. 20

Revendications

1. Un ensemble charnière (100) pour un lave-vaisselle, l'ensemble charnière comprenant : 25

un manchon de friction de charnière (11) ayant une rainure d'insertion (111), dans lequel la rainure d'insertion (111) s'étend le long d'une direction longitudinale du manchon de friction de charnière (11) et a une première extrémité munie d'une tige d'encliquetage (112) et une deuxième extrémité munie d'une partie d'encliquetage (113) ; et 30

une charnière en forme de L (12) ayant une branche horizontale (121) montée dans la rainure d'insertion (111), dans lequel la branche horizontale (121) a une première extrémité encliquetée avec la tige d'encliquetage (112) et une deuxième extrémité munie d'une rainure axiale ouverte (1212) montée avec la partie d'encliquetage (113), la partie d'encliquetage (113) est encliquetée dans la rainure axiale ouverte (1212) pour fermer une ouverture de la rainure axiale ouverte (1212), et un bord supérieur de la rainure axiale ouverte (1212) est espacé d'un bord supérieur de la partie d'encliquetage (113) à une distance prédéterminée ; 35

dans lequel le manchon de friction de charnière (11) et la charnière en forme de L (12) sont configurés pour être fixés au lave-vaisselle et l'ensemble charnière (100) est configuré pour être monté de manière pivotante sur un arbre de lave-vaisselle (201) ; un corps de porte (300) du lave-vaisselle est configuré pour pouvoir être monté sur une branche verticale (122) de la 40

charnière en forme de L (12), et la rainure axiale ouverte (1212) de la charnière en forme de L (12) est encliquetée sur l'arbre du lave-vaisselle (201) qui est muni d'un réservoir intérieur (200) du lave-vaisselle, de sorte que l'arbre du lave-vaisselle (201) est entouré par la rainure axiale ouverte (1212) et la partie d'encliquetage (113). 45

2. L'ensemble charnière (100) selon la revendication 1, dans lequel une paroi latérale gauche de la rainure axiale ouverte (1212) est munie d'une première partie concave (1212a) et une paroi latérale droite de celle-ci est munie d'une deuxième partie concave (1212b), et la partie d'encliquetage (113) comprend une jambe d'encliquetage gauche (1131) ayant un premier crochet convexe (1131a) équipé de la première partie concave (1212a) et une jambe d'encliquetage droite (1132) ayant un deuxième crochet convexe (1132a) équipé de la deuxième partie concave (1212b). 50

3. L'ensemble charnière (100) selon la revendication 2, dans lequel le premier crochet convexe (1131a) a une première jambe de branche (1131b) sur celui-ci et le deuxième crochet convexe (1132a) a une deuxième jambe de branche (1132b) sur celui-ci. 55

4. L'ensemble charnière (100) selon la revendication 3, dans lequel les bords supérieurs respectifs de la première jambe de branche (1131b) et de la deuxième jambe de branche (1132b) sont arrondis. 60

5. L'ensemble charnière (100) selon la revendication 1, dans lequel la première extrémité de la branche horizontale (121) de la charnière en forme de L (12) a un mousqueton (1211) équipé de la tige d'encliquetage (112). 65

6. L'ensemble charnière (100) selon la revendication 5, dans lequel le mousqueton (1211) est un mousqueton en forme de U, et une section de la tige d'encliquetage (112) est en forme de demi-cercle ou de cercle. 70

7. L'ensemble charnière (100) selon la revendication 1, dans lequel une surface avant du manchon de friction de charnière (11) a une nervure convexe (114) sur celle-ci. 75

8. L'ensemble charnière (100) selon la revendication 7, dans lequel une pluralité des nervures convexes (114) sont prévues et espacées uniformément le long de la direction longitudinale du manchon de friction de charnière (11). 80

9. L'ensemble charnière (100) selon la revendication 7, dans lequel une surface arrière du manchon de friction de charnière (11) a un bossage de support 85

(115) sur celui-ci.

10. Un lave-vaisselle, **caractérisé en ce que** le lave-vaisselle comprend un ensemble charnière (100) pour un lave-vaisselle selon l'une quelconque des revendications 1 à 9. 5

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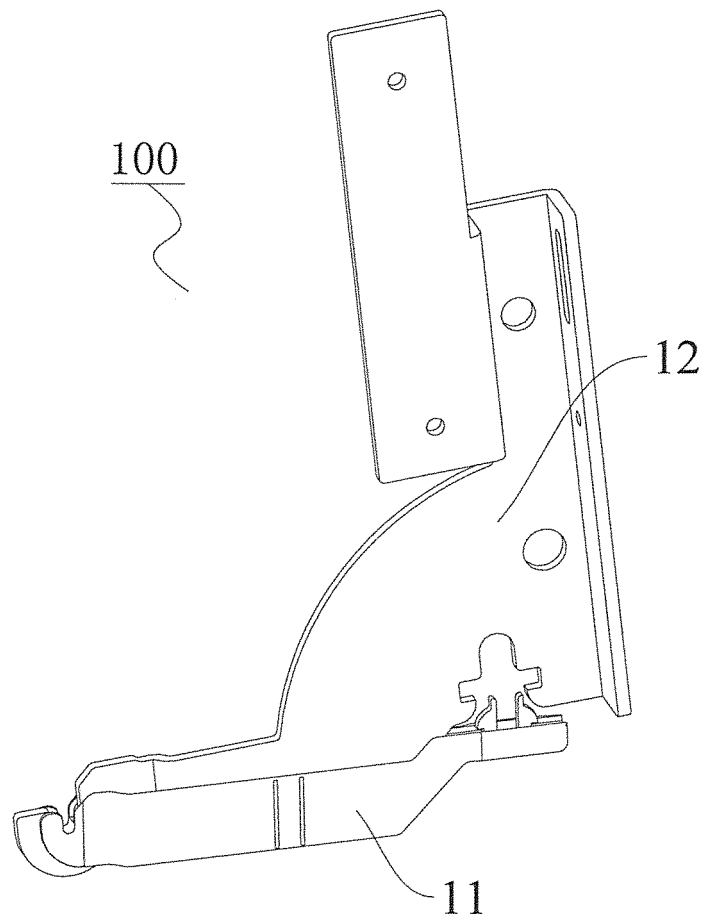


Fig. 1

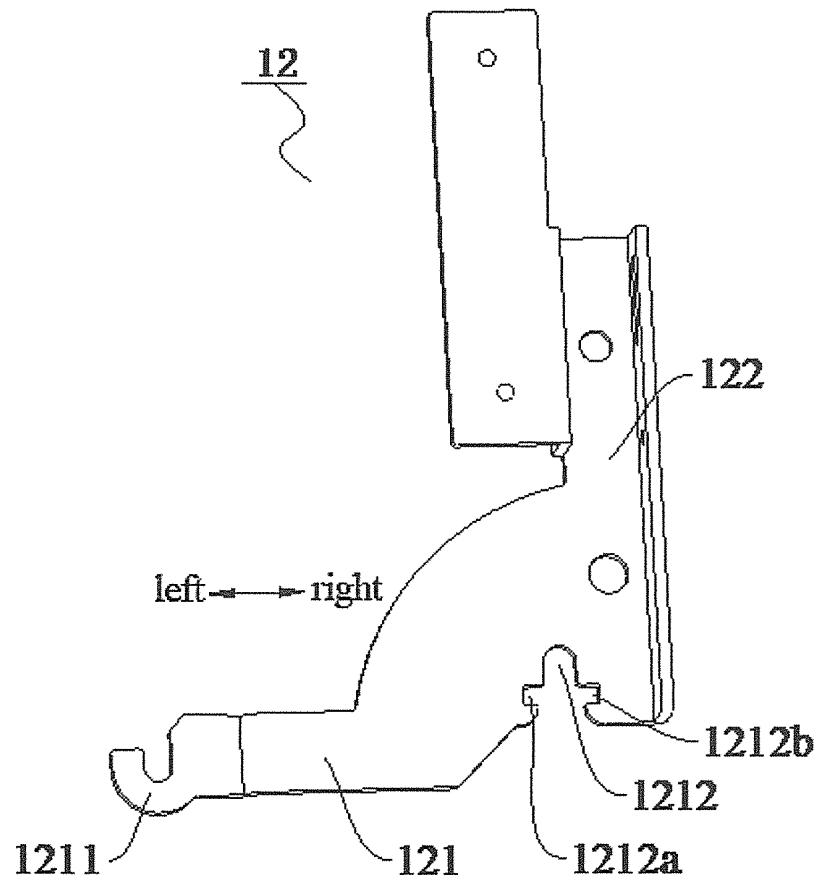


Fig. 2

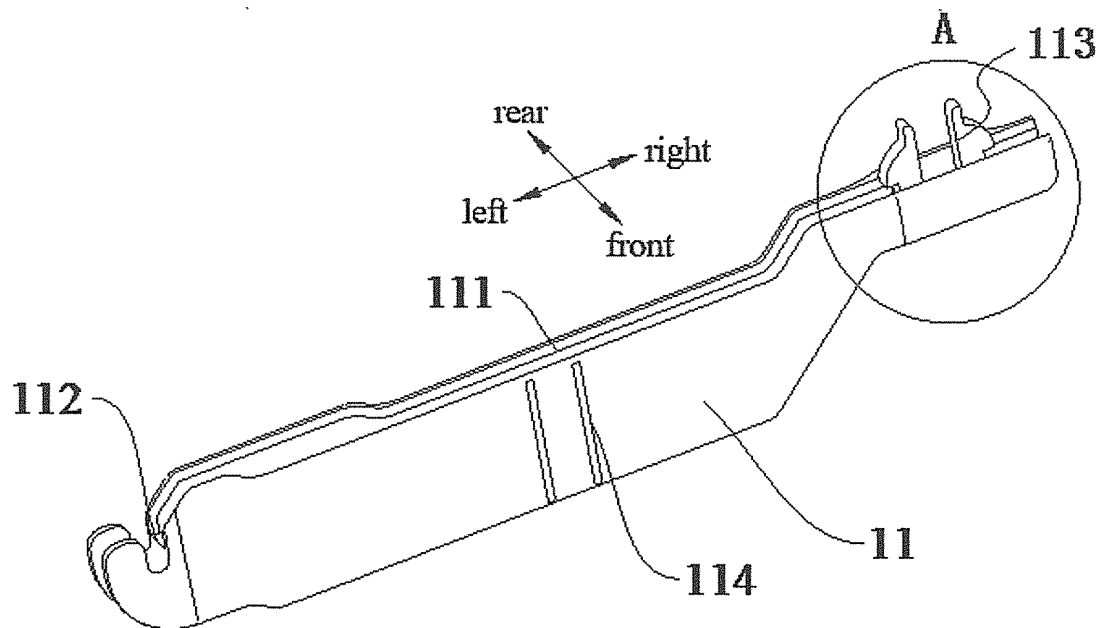


Fig. 3

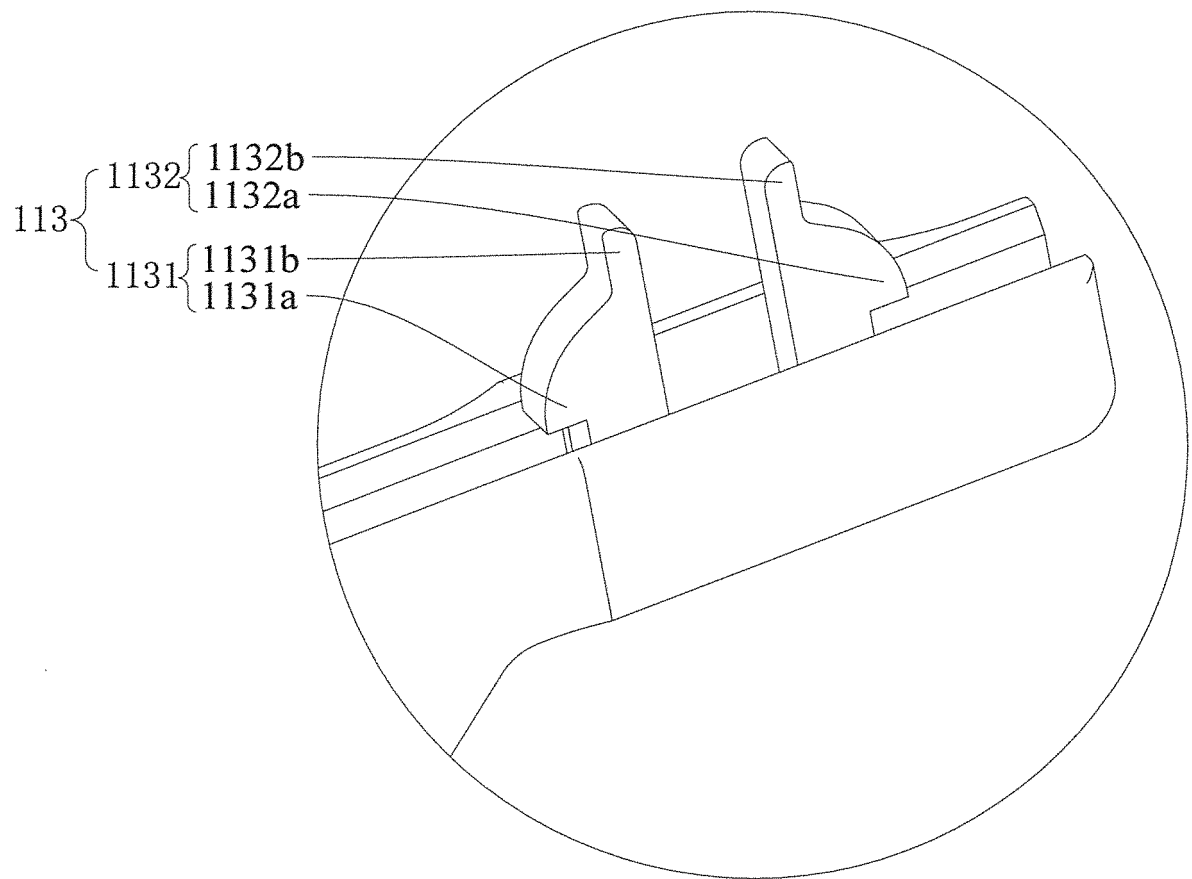


Fig. 4

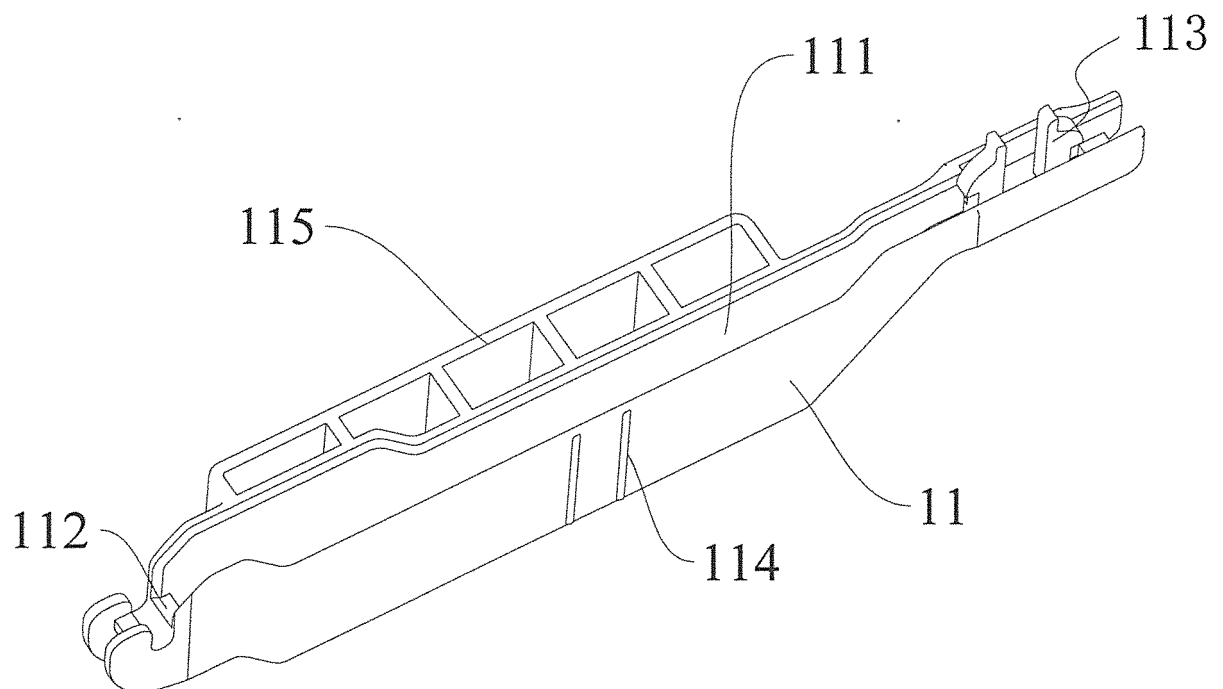


Fig. 5

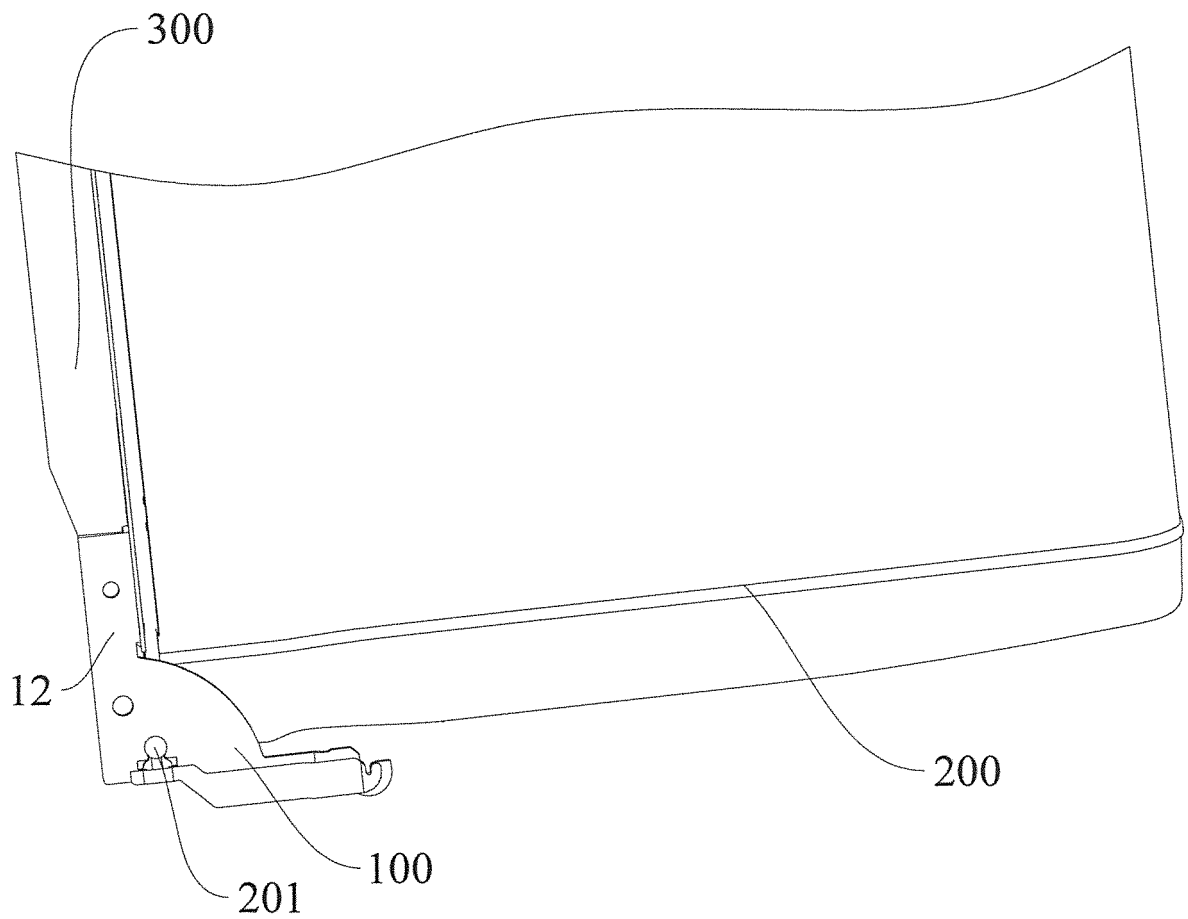


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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